

teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Before discussing the non-applicability of the cited art to the claimed invention, applicants note that claim 7, which is the only independent claim in this application recites the feature of a vacuum processing apparatus comprising a vacuum container in which an inside thereof is evacuated and in which a wafer is processed using plasma therein. Referring to Figs. 5 - 8 of the drawings of this application, the vacuum container is represented by the members 511 and 512 as described in the paragraph bridging pages 23 and 24 of the specification. As recited in claim 7, there is also provided an inner chamber detachably disposed inside the vacuum container, which is represented by inner chamber portions 509 and 510, for example, which are detachably removable from the vacuum container in the manner illustrated in Figs. 7 and 8 of the drawings of this application. Claim 7 further recites the feature that the inner chamber has an inner space in which a wafer table, as represented by table 504 in Fig. 5, for example, for supporting the wafer thereon is disposed, and in which a processing gas is supplied, with the inner chamber having an axisymmetric structure. Claim 7 further recites that a sidewall, represented by the portion 509 of the inner chamber, delimits a part of the inner chamber and has an

opening disposed therein to which the wafer to be supported on the wafer table is passed, noting as shown in Figs. 5 and 6 of the drawings of this application, the opening is closed by a gate valve 513. Claim 7 further recites the feature of a gate disposed so as to enable communication with the opening in the sidewall of the inner chamber so as to enable transfer of the wafer from outside of the vacuum container to the inner space of the inner chamber through the opening in the sidewall. As shown in Figs. 5 and 6, a portion of the vacuum container 511 forms a gate in communication with the outside as represented by a transfer chamber through which a wafer is communicated through the opening in the vacuum container 511 and the opening in the sidewall 509 of the inner chamber to the wafer table 504 therein. Further, claim 7 recites the feature of a valve, as represented by the valve 513, disposed between the opening in the sidewall and the gate, which valve is movable with respect to the outside of the sidewall of the inner chamber so as to open and close the opening and sealing the opening in an airtight manner, a portion valve having a shape which does not interfere with the axisymmetric structure of the inner chamber. Irrespective of the position set forth by the Examiner, applicants submit that the features as recited in claim 7 and the dependent claims are not disclosed or taught in the cited art, as will become clear from the following discussion.

Turning to Hao, while the Examiner mischaracterized this patent as comprising "a vacuum container (Figs. 3A and 3B, 104) in which an inside thereof is evacuated and in which a wafer is processed using plasma therein (col. 4, rows 6-10); an inner chamber (102) disposed inside the vacuum container and having an inner space in which a processing gas is supplied" (emphasis added), applicants note that Hao does not describe "an inner chamber (102)", as contended by the Examiner. Rather, column 4, lines 35 - 38 of Hao describe Figs. 3A and 3B as

"includes a liner 102, a process chamber 104, a valve chamber 106, a slot valve plate 108, a liner aperture 110, a rod 112, and an actuator 114". (emphasis added). Moreover, column 5, lines 5 - 10 of Hao defines the term "chamber" as referring to either the first chamber embodiment having a separate process chamber and a separate valve chamber or the second chamber embodiment having a combined process chamber and valve chamber. In any event, Hao recognizes that the member 102, which is characterized by the Examiner as "an inner chamber 102" (emphasis added) is not a "chamber", as described and claimed in this application or as disclosed and claimed in Hao, but rather a "liner 102" (emphasis added) which differs from a "chamber" and in particular, the process chamber 104 as described by Hao. Thus, irrespective of the contentions by the Examiner, applicants submit that Hao does not disclose or teach "an inner chamber ... disposed inside the vacuum container and having an inner space in which a wafer table for supporting the wafer thereon is disposed ...". That is, the liner 102 of Hao is not an inner chamber, and it is not seen that a wafer table is disposed within the inner space of the inner chamber, as recited in claim 7. As such, applicants submit that claim 7 patentably distinguishes over Hao with respect to the provision of an inner chamber in the sense of 35 USC 103 and should be considered allowable thereover with respect to this feature alone.

Since Hao does not provide an inner chamber as recited in claim 7, it is readily apparent that Hao also does not provide a sidewall delimiting a part of the inner chamber and having an opening disposed therein, a gate disposed in the manner set forth with respect to the inner chamber and vacuum container, nor a valve disposed between the opening in the sidewall and the gate, as recited. More particularly, claim 7 recites the feature of "the valve being movable with respect to

the outside of the sidewall of the inner chamber so as to open and close the opening and for sealing the opening in an airtight manner". (emphasis added). As shown in Figs. 5 - 7 of the drawings of this application, for example, in accordance with the present invention, the gate valve 513 has a configuration in which a portion of the valve 513 fills the opening in the sidewall of the chamber 509 and becomes flush with the inner portion of the sidewall of the inner chamber. On the other hand, an outer portion of the valve 513 extends beyond the opening of the sidewall so as to cover the opening and effect airtight sealing of the inner chamber, in the manner set forth in claim 7. Turning to Hao, while the Examiner contends that the valve 110 seals the opening in an airtight manner, such feature is not disclosed or taught by Hao. As described in column 4, lines 56 - 64 and as clearly illustrated in Figs. 3A and 3B of the drawings of Hao, for example:

In the illustrative reactor 100, the slot valve plate 108 is configured to "sit on" the valve chamber 106 and covers the valve chamber aperture, the process chamber aperture and the liner aperture, thereby permitting the generation of a vacuum in the process chamber 104. The liner aperture plate 110 is configured to occupy the liner aperture. The liner aperture plate 100 has sufficient clearance from the liner aperture to be able to move in and out of the liner aperture. (emphasis added).

Thus, Hao recognizes that a clearance between the liner aperture plate 110 and the aperture of the liner 102 is required, whereas for sealing purposes of the process chamber 104, the valve plate 108 is configured to "sit on" the valve chamber 106 so as to cover the valve chamber aperture. Applicants note that Fig. 3B of Hao evidences a clearance between the opening in the liner 102 and the aperture plate 110. Thus, Hao recognizes the difference in a structure which effects sealing of an aperture and one which does not effect sealing of an aperture, such that it is apparent that the aperture plate 110 of Hao does not effect sealing, as recited in claim 7 and the dependent claims of this application. Accordingly, applicants submit

that claim 7 also patentably distinguishes over Hao with regard to the feature of sealing.

The Examiner recognizing that "Hao fails to explicitly teach the inner chamber is detachable disposed with respect to the vacuum container so as to enable lifting up of the inner chamber from the vacuum chamber" (emphasis added) refers to the patent to Nitescu et al. The Examiner contends that "Nitescu et al teach the use of a flexible, removable shield for plasma chamber for the purpose of protecting the inner walls of a plasma processing reactor (column 2, rows 10 - 18). The liner is liftable through the top of the reactor when the lid is removed so that the liner can be replaced (column 3, rows 25 - 31 and column 6, rows 28 - 34, 57-63)". (emphasis added). Thus, it is apparent that the Examiner recognizes that the "removable shield" of Nitescu et al corresponds to the "liner" of Hao, and that neither the removable shield or liner of Nitescu et al nor the liner of Hao represent an "inner chamber" detachably disposed inside the vacuum container, with the other features as recited in claim 7 and the dependent claims. Irrespective of this recognition by the Examiner, the Examiner continues to utilize "inner chamber" and "liner" interchangeably, which is contrary to the specific disclosures of Nitescu et al and Hao, in an attempt to provide the claimed features of claim 7 and the dependent claims by a hindsight reconstruction attempt which is not permissible. See, In re Fine, supra. That is, the Examiner states:

It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have the inner chamber detachably disposed with respect to the vacuum container so as to enable lifting up of the inner chamber from the vacuum chamber in Hao in order to replace the protecting liner as taught by Nitescu et al. (emphasis added).

Turning to Nitescu et al, as recognized by the Examiner, this patent discloses a "removable shield" or "liner", which is not an "inner chamber", and as pointed out

above, Hao also discloses the utilization of a "liner" which is not an "inner chamber", as claimed. Furthermore, in Nitescu et al., the shield or liner 38 is provided with two apertures, i.e., a slit valve opening 42 and the window opening 44. Neither of these openings or apertures are sealed in an airtight manner, but such apertures remain open, as disclosed in Nitescu et al. Thus, Nitescu et al, like Hao fails to provide a disclosure or teaching of a valve which seals the opening in an airtight manner and has a shape which does not interfere with the axisymmetric structure of the inner chamber, recognizing that neither Nitescu et al or Hao et al disclose a detachable inner chamber having the features as recited. Applicants further note that Nitescu et al issued in 1997, and Hao is based upon a provisional application filed in 2001, some four years later. Assuming arguendo, that Hao adopted the teachings of a removable liner, it is readily apparent that the combination does not provide an inner chamber detachably disposed in a vacuum container and having the features, as recited with a valve airtightly sealing the inner chamber and configured in the manner set forth. Thus, applicants submit that claim 7 and the dependent claims patentably distinguish over the combination of Hao and Nitescu et al in the sense of 35 USC 103, and all claims should be considered allowable thereover.

With regard to the dependent claims, it is noted that such claims recite further features of the present invention. For example, claims 15 - 18 recite the feature of another valve disposed outside of the gate which enables sealing of the gate in an airtight manner. Applicants note that such another valve refers to the valve 514 as illustrated in the drawings of this application which covers and seals the vacuum chamber and would correspond to the valve 108 in Figs. 3A and 3B of Hao. Again, it is readily apparent that Hao recognizes that the aperture plate 110 does not effect sealing. In fact, looking to claim 1 of Hao, Hao recites the feature of "a liner having a

liner aperture adapted to provide passage for a wafer; a chamber coupled to said liner, said chamber having a chamber aperture adapted to provide passage for said wafers; a slot valve plate configured to cover said chamber aperture; a liner aperture plate configured to occupy said liner aperture." (emphasis added). Thus, applicants submit that the dependent claims recite further features not disclosed or taught by Hao or Nitescu et al in the sense of 35 USC 103, and all claims patentably distinguish over this cited art and should now be in condition for allowance.

In view of the above, applicants request favorable action in this application and issuance of a Notice of Allowance. Applicants request that this paper be also considered as a Notice of Appeal, and applicants hereby appeal the final rejection of claims 7 - 19, and authorize the charging of the appeal fees as set forth below. However, applicants request that the charging of the appeal fees be held in abeyance pending a determination of the action of the Examiner, noting that if the Examiner allows this application, a Notice of Appeal and charging of the appeal fees become unnecessary.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees and notice of appeal fees, to the

deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 648.43120CX1), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

  
Melvin Kraus  
Melvin Kraus  
Registration No. 22,466

MK/jla  
(703) 312-6600